

PATENT ABSTRACTS OF JAPAN

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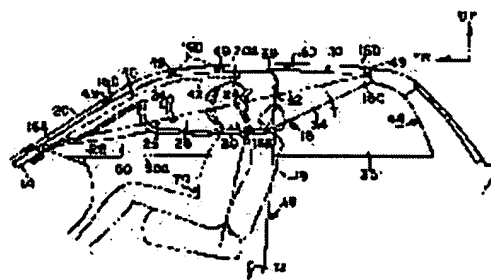
SAKAKIBARA AKIHIKO

(54) HEAD PROTECTION AIRBAG DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To shorten the inflating completion time of an airbag body without causing a significant cost increase.

SOLUTION: The front end part 16A of an airbag body 16 is disposed at a position where an inflator 14 is disposed, and the section of the airbag body 16 disposed along a front pillar 20 is made to serve as a gas introduction passage 40 for feeding gas to inflating chambers 26, 28, 39, 32 for front seat. A reinforcing liner tube 42 leading to a position beyond front seat inflating chambers 26, 28, 30, 32 on the upstream side from the inflator 14 is provided in the gas introduction passage 40. The gas jetted from the inflator 14 is fed through the reinforcing liner tube 42, starting with the front seat inflating chamber 32 on the downstream side farthest from the inflator 14.



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CLAIMS

[Claim(s)]

[Claim 1] Ranging over a roof side, it is stored with the single inflator arranged by the pillar lower part from a pillar. In head protection air bag equipment equipped with the curtain-like air bag bag body with which two or more expansion chambers were formed in the direction which intersects the tension line with which the body flank order fixed point is contracted of the non-expanding section In the gas installation path to each expansion chamber in said air bag bag body, it is installed to the location which exceeds the upstream expansion chamber near an inflator from the connection section with an inflator. Head protection air bag equipment characterized by having a liner tube for reinforcement for supplying gas previously from a downstream expansion chamber far from an inflator.

[Claim 2] It is head protection air bag equipment according to claim 1 which said inflator is arranged by A pillar lower part, and is characterized by said air bag bag body being an object for front seats.

[Claim 3] Said inflator is head protection air bag equipment according to claim 1 which it is arranged by A pillar lower part, and said air bag bag body is equipped with two or more expansion chambers for front seats and expansion chambers for backseats, and is characterized by having prolonged said liner tube for reinforcement to the location which can supply gas to the downstream expansion chamber in the expansion chamber for front seats.

[Claim 4] It is head protection air bag equipment according to claim 1 which said inflator was arranged by C pillar lower part, said air bag bag body was equipped with two or more expansion chambers for front seats and expansion chambers for backseats, and said liner tube for reinforcement has be prolong to the location which can supply gas to the upstream expansion chamber of the expansion chamber for front seats exceeding the expansion chamber for backseats, and is characterize by for the cross-sectional area of the gas installation path between the expansion chamber for front seats and the expansion chamber for backseats to be larger than the cross-sectional area of said liner tube for reinforcement.

[Claim 5] It is head protection air bag equipment according to claim 1 characterized by to form gas-supply opening for said inflator having been arranged by C pillar lower part, said air bag bag body having been equipped with two or more expansion chambers for front seats and expansion chambers for backseats, and said liner tube for reinforcement having been prolonged to the location which can supply gas to the upstream expansion chamber of the expansion chamber for front seats exceeding the expansion chamber for backseats, and supply gas to the expansion chamber for backseats at said liner tube for reinforcement.

[Claim 6] Ranging over a roof side, it is stored with the single inflator arranged by the pillar lower part from a pillar. In head protection air bag equipment equipped with the curtain-like air bag bag body with which two or more expansion chambers were formed in the direction which intersects the tension line with which the body flank order fixed point is contracted of the non-expanding section Head protection air bag equipment characterized by the gas installation path to the expansion chamber for front seats in said air bag bag body and the gas installation path to the expansion chamber for backseats being independently mutually.

[Claim 7] Head protection air bag equipment according to claim 6 characterized by connecting to an

inflator the gas installation path of the expansion chamber for front seats and the gas installation path of the expansion chamber for backseats which were formed in said air bag bag body through a rigid high branch pipe from the base fabric of said air bag bag body.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention gushes gas from an inflator at the time of the predetermined object for Jusaku Takani to a car-body flank, and relates to the head protection air bag equipment which expands the air bag bag body stored along with the roof side-rail section from the pillar section by this gas in the shape of a curtain.

[0002]

[Description of the Prior Art] The head protection air bag equipment which expands the air bag bag body which folded up ranging over the roof side-rail section from the front pillar section, and was stored in the condition in order to have raised the head protection engine performance of the crew who sat down on the sheet at the time of the predetermined object for Jusaku Takani to a car-body flank in the shape of a curtain along with side window glass is already proposed. The configuration hereafter shown in JP,9-156450,A which indicated this kind of head protection air bag equipment is explained.

[0003] As shown in drawing 16, front pillar mounting section 100A is being fixed to the vehicle indoor flank of the front pillar 102 of a car by the holddown members 104, such as a bolt, and, as for the air bag bag body 100 of this head protection air bag equipment, roof side-rail mounting section 100B is being fixed to the vehicle indoor flank of the roof side rail 106 of a car by the holddown members 104, such as a bolt.

[0004] Moreover, as for the air bag bag body 100, bag body section 100C of the shape of a curtain which front pillar mounting section 100A and roof side-rail mounting section 100B equipped with two or more expansion chambers which are formed on the same straight line and prolonged in the abbreviation vertical direction in the lower part is formed. Opening 100D is formed in the front end of the air bag bag body 100, gas induction tubing is connected with this opening 100D, and the air bag bag body 100 develops in the shape of a curtain along with side window glass 110 by the gas spouted from the inflator 108 formed in the lower part of a front pillar 102 at the time of air bag bag body expansion.

[0005]

[Problem(s) to be Solved by the Invention] However, in head protection air bag equipment which was mentioned above, two or more expansion chambers of the air bag bag body 100 carry out expansion expansion by the blowout gas from an inflator 108 at order from the expansion chamber by the side of the part near an inflator 108, i.e., a front pillar. For this reason, the time amount to which an air bag bag body completes expansion thoroughly becomes long. When the expansion chamber for backseats is set up especially in addition to the expansion chamber for front seats, in order that the expansion chamber for backseats and an inflator may separate, the time amount to which an air bag bag body completes expansion thoroughly becomes still longer. large in this case, although it is possible to arrange an inflator also in C pillar in order to improve this -- it takes cost quantity.

[0006] It is the object to obtain the head protection air bag equipment which this invention cannot be accompanied by the large cost high in consideration of the above-mentioned data, but can shorten the completion time amount of expansion of an air bag bag body.

[0007]

[Means for Solving the Problem] The single inflator in which this invention according to claim 1 is arranged by the pillar lower part, The curtain-like air bag bag body with which two or more expansion chambers were formed in the direction which intersects the tension line with which it is stored in ranging over a roof side from a pillar, and the body flank order fixed point is contracted of the non-expanding section, In preparation ***** protection air bag equipment, in the gas installation path to each expansion chamber in said air bag bag body It is installed to the location which exceeds the upstream expansion chamber near an inflator from the connection section with an inflator, and is characterized by having a liner tube for reinforcement for supplying gas previously from a downstream expansion chamber far from an inflator.

[0008] Therefore, gas is previously supplied from a downstream expansion chamber far from an inflator with the liner tube for reinforcement, and an air bag bag body carries out expansion expansion from a downstream expansion chamber. Moreover, since an upstream expansion chamber is also reduced with expansion expansion of a downstream expansion chamber, the completion time amount of expansion of an air bag bag body can be shortened. Moreover, since the completion time amount of expansion of an air bag bag body can be shortened only by changing the die length of the liner tube for reinforcement, without changing the configuration of an air bag bag body substantially, there is no large cost high.

[0009] In head protection air bag equipment according to claim 1, said inflator is arranged for this invention according to claim 2 by A pillar lower part, and it is characterized by said air bag bag body being an object for front seats.

[0010] therefore, a content according to claim 1 -- in addition, the gas flow sudden change section from a gas installation path to an expansion chamber -- a pillar garnish -- comparing -- deformation -- since it can shift in the easy roof lining section, the load by the high pressure gas to A pillar garnish at the time of air bag bag body expansion expansion can be reduced.

[0011] In head protection air bag equipment according to claim 1, said inflator is arranged by A pillar lower part, this invention according to claim 3 is equipped with the expansion chamber for front seats and the expansion chamber for backseats of plurality [bag body / said / air bag], and said liner tube for reinforcement is characterized by having extended to the location which can supply gas to the downstream expansion chamber in the expansion chamber for front seats.

[0012] Therefore, in addition to a content according to claim 1, the gas spouted from the inflator is distributed and supplied to the downstream expansion chamber and the expansion chamber for backseats in the expansion chamber for front seats far from an inflator with the liner tube for reinforcement.

Consequently, since gas is quickly supplied also to the expansion chamber for backseats, the completion time amount of expansion of an air bag bag body can be shortened.

[0013] This invention according to claim 4 is set to head protection air bag equipment according to claim 1. It is arranged by C pillar lower part and, as for said inflator, said air bag bag body is equipped with two or more expansion chambers for front seats and expansion chambers for backseats. Said liner tube for reinforcement is prolonged to the location which can supply gas to the upstream expansion chamber of the expansion chamber for front seats exceeding the expansion chamber for backseats, and it is characterized by the cross-sectional area of the gas installation path between the expansion chamber for front seats and the expansion chamber for backseats being larger than the cross-sectional area of said liner tube for reinforcement.

[0014] Therefore, in the early stages of air bag bag body expansion, the gas spouted from the inflator is supplied also to the expansion chamber for backseats from the clearance between the gas installation path between the expansion chamber for front seats, and the expansion chamber for backseats, and the liner tube for reinforcement while it is supplied to the upstream expansion chamber of the expansion chamber for front seats far from an inflator with the liner tube for reinforcement. Consequently, also when an inflator is arranged in C pillar lower part, the completion time amount of expansion of an air bag bag body can be shortened.

[0015] This invention according to claim 5 is set to head protection air bag equipment according to claim 1. It is arranged by C pillar lower part and, as for said inflator, said air bag bag body is equipped

with two or more expansion chambers for front seats and expansion chambers for backseats. Said liner tube for reinforcement is prolonged to the location which can supply gas to the upstream expansion chamber of the expansion chamber for front seats exceeding the expansion chamber for backseats, and it is characterized by forming gas supply opening for supplying gas to the expansion chamber for backseats in said liner tube for reinforcement.

[0016] Therefore, the gas spouted from the inflator is supplied to the expansion chamber for backseats from gas supply opening of the liner tube for reinforcement while it is supplied to the expansion chamber for front seats far from an inflator with the liner tube for reinforcement. Consequently, also when an inflator is arranged in C pillar lower part, the completion time amount of expansion of an air bag bag body can be shortened.

[0017] The single inflator in which this invention according to claim 6 is arranged by the pillar lower part, The curtain-like air bag bag body with which two or more expansion chambers were formed in the direction which intersects the tension line with which it is stored in ranging over a roof side from a pillar, and the body flank order fixed point is contracted of the non-expanding section, In preparation ***** protection air bag equipment, it is characterized by the gas installation path to the expansion chamber for front seats in said air bag bag body and the gas installation path to the expansion chamber for backseats being independently mutually.

[0018] Therefore, since gas is simultaneously supplied to the expansion chamber for front seats, and the expansion chamber for backseats from the independent gas installation path, gas can be quickly supplied also to the expansion chamber of a side far from an inflator, and the completion time amount of expansion of an air bag bag body can be shortened. Moreover, each expansion timing of the expansion chamber for front seats and the expansion chamber for backseats can be easily adjusted by adjusting each independent gas installation path cross section. Furthermore, when an inflator is arranged in A pillar lower part, in order to arrange the independent gas installation path along with A pillar, the crew head protection area of A pillar section is expanded.

[0019] This invention according to claim 7 is characterized by connecting to an inflator the gas installation path of the expansion chamber for front seats and the gas installation path of the expansion chamber for backseats which were formed in said air bag bag body through a rigid high branch pipe from the base fabric of said air bag bag body in head protection air bag equipment according to claim 6.

[0020] Therefore, since the high pressure gas from an inflator is distributed by the gas installation path of the expansion chamber for front seats, and the gas installation path of the expansion chamber for backseats in a rigid high branch pipe from the base fabric of the air bag bag body set up out of the air bag bag body in addition to a content according to claim 6, breakage of the base fabric of the air bag bag body by the high pressure gas spouted from an inflator can be prevented.

[0021]

[Embodiment of the Invention] The 1st operation gestalt of the head protection air bag equipment of this invention is explained according to drawing 1 - drawing 4 .

[0022] In addition, in the drawing Nakaya mark FR, an arrow head UP shows the direction of the car upper part, and an arrow head IN shows the direction of the breadth-of-a-car inside for the direction of the car front.

[0023] As shown in drawing 1 , head protection air bag equipment 10 is constituted considering the sensor 12 for detecting side ***** , the inflator 14 of the shape of a cylinder which spouts gas by operating, and the air bag bag body 16 as a main component. The sensor 12 is arranged near the soffit section of the center pillar (B pillar) 18, and when side ***** beyond a predetermined value acts on a car-body flank, it detects side ***** .

[0024] The inflator 14 is arranged near the connection of the front pillar 20 and instrument panel 22 as the lower part of a front pillar (A pillar) 20, and is connected with the sensor 12 mentioned above. Therefore, a sensor's 12 detection of side ***** operates an inflator 14.

[0025] It is the head protection air bag bag body for front seats from which the air bag bag body 16 protects head 70A of the crew 70 who sat down to the front seat 19 with this operation gestalt.

Moreover, to this air bag bag body 16 While crossing the tension line T which contracts the front end

fixed point and the back end fixed point of the air bag bag body 16 with the vertical direction pars intermedia and making the vertical direction into a longitudinal direction by side view, two or more non-expanding sections 24 of the shape of radii which swelled to the upstream (front side) near an inflator 14 are formed at the predetermined spacing. Moreover, in this air bag bag body 16, two or more expansion chambers 26, 28, 30, and 32 for front seats which cross the tension line T by the non-expanding section 24 at the time of air bag bag body expansion are formed. In addition, in this air bag bag body 16, rear side door glass 33 and the part which counters serve as the non-expanding section 34.

[0026] Front end section 16A of the air bag bag body 16 is arranged in the inflator arrangement location, and the upper bed edge of pars intermedia 16B is arranged along with the front pillar 20 and the roof side rail 38. Moreover, the part of the air bag bag body 16 arranged along with the front pillar 20 serves as the gas installation path 40 for sending gas into the expansion chambers 26, 28, 30, and 32 for front seats, and the liner tube 42 for reinforcement which results to the location which exceeded the expansion chambers 26, 28, and 30 for front seats of the upstream from the inflator 14 is set up in this gas installation path 40. Therefore, the gas spouted from the inflator 14 is previously supplied with the liner tube 42 for reinforcement from the expansion chamber 32 for front seats of the downstream far from an inflator 14. In addition, the upper bed edge of back end section 16C of the air bag bag body 16 is arranged to the quarter pillar (C pillar) 44 neighborhood.

[0027] As shown in drawing 2, the air bag bag body 16 is held ranging over the front pillar garnish 46 and cross direction lateral part 48A of the roof headlining 48, after being folded up in the shape of bellows in the abbreviation vertical direction and being made the shape of a long picture. In addition, projection formation of the mounting section 16D is carried out at the predetermined spacing, and such mounting section 16D is being fixed to the upper bed section of the air bag bag body 16 by the holddown members 49, such as a clip and a bolt.

[0028] As shown in drawing 3, the air bag bag body 16 is folded up in the direction of an abbreviation right angle to vehicle indoor side-face 50A of frontside door glass 50. In addition, when the air bag bag body 16 develops, the clearance blockaded by the weather strip 54 of the front pillar garnish 46 and the front pillar inner panel 52 can extend by the expansion expansion force of the air bag bag body 16, and the air bag bag body 16 develops to the vehicle interior of a room from the clearance which was able to be extended.

[0029] In addition, the sign 60 shown in drawing 3 is a front pillar outer panel, and a sign 62 is front pillar reinforcement.

[0030] Moreover, as shown in drawing 4, when the air bag bag body 16 develops, the clearance blockaded by the weather strip 58 of cross direction lateral part 48A of the roof headlining 48 and the roof side inner panel 56 can extend by the expansion expansion force of the air bag bag body 16, and the air bag bag body 16 develops to the vehicle interior of a room from the clearance which was able to be extended.

[0031] In addition, the signs 64 shown in drawing 4 are [a roof side member and the sign 68 of a roof panel and a sign 66] roof side-rail outer reinforcements.

[0032] Next, an operation of this operation gestalt is explained. With the head protection air bag equipment of this operation gestalt, if side ***** beyond a predetermined value acts on a car-body flank, having had a side collision will be detected by the sensor 12. For this reason, an inflator 14 operates and the gas of the specified quantity is spouted. Thereby, the air bag bag body 16 begins to expand, pushing cross direction lateral part 48A of the pillar garnish 46 of a front pillar 20, and the roof headlining 48 open, along with vehicle indoor side-face 50A of frontside door glass 50, swelling of the air bag bag body 16 which expanded is carried out to the shape of a curtain, and it protects crew's 70 head 70A.

[0033] Under the present circumstances, with the head protection air bag equipment of this operation gestalt, the gas spouted from the inflator 14 passes along the liner tube 42 for reinforcement, and is previously supplied exceeding the expansion chambers 26, 28, and 30 for front seats of the upstream near an inflator 14 from the expansion chamber 32 for front seats of the downstream far from an inflator 14. Consequently, if expansion expansion is carried out from the expansion chamber 32 for front seats

of the downstream, in case the expansion chamber 32 for front seats of the downstream carries out expansion expansion, the expansion chambers 30, 28, and 26 for front seats of the upstream will also be reduced by **. For this reason, the completion time amount of expansion of the air bag bag body 16 can be shortened.

[0034] Moreover, since the completion time amount of expansion of the air bag bag body 16 can be easily shortened with the head protection air bag equipment of this operation gestalt only by installing the liner tube 42 for reinforcement to add back, without changing the configuration of the air bag bag body 16 substantially, there is no large cost high.

[0035] moreover , the thing for which the liner tube 42 for reinforcement be back install with the head protection air bag equipment of this operation gestalt -- the gas flow sudden change section from the gas installation path 40 of the air bag bag body 16 to an expansion chamber -- the front pillar garnish 46 -- compare -- deformation -- since it can shift to cross direction lateral part 48A of the easy roof headlining 48 , the load by the high pressure gas which act on the front pillar garnish 46 at the time of air bag bag body expansion expansion can be reduce .

[0036] Next, the 2nd operation gestalt of the head protection air bag equipment of this invention is explained according to drawing 5 and drawing 6 .

[0037] In addition, if attached to the same member as the 1st operation gestalt, the same sign is attached and the explanation is omitted.

[0038] As shown in drawing 5 , with this operation gestalt, on both sides of the non-expanding section 34, the expansion chambers 74 and 76 for backseats are formed behind two or more expansion chambers 26, 28, 30, and 32 for front seats of the air bag bag body 16, and the non-expanding section 78 of the shape of radii which swells to the upstream (front side) is formed between the expansion chamber 74 for backseats, and the expansion chamber 76 for backseats. Moreover, between the expansion chamber 32 for front seats, and the expansion chamber 74 for backseats, the gas installation path 80 which opens the expansion chamber 32 for front seats and the expansion chamber 74 for backseats for free passage is formed.

[0039] Therefore, as shown in drawing 6 , the gas spouted from the inflator 14 is first supplied to the expansion chamber 32 for front seats of the downstream, and the expansion chamber 74 for backseats of the upstream with the liner tube 42 for reinforcement.

[0040] Moreover, in this operation gestalt, the non-expanding section 24 formed among the expansion chambers 26, 28, 30, and 32 for front seats swelled to the downstream (back side) far from an inflator 14, and has become circular to it, and back end lower 16E of the air bag bag body 16 is connected with the lower part of the quarter pillar 44 by strap 16F.

[0041] Next, an operation of this operation gestalt is explained. With the head protection air bag equipment of this operation gestalt, the gas which was spouted by the 1st operation gestalt from the inflator 14 in addition to the operation of a publication is distributed and supplied to the expansion chamber 32 for front seats of the downstream far from an inflator 14, and the expansion chamber 74 for backseats of the upstream with the liner tube 42 for reinforcement. Consequently, since gas is quickly supplied also to the expansion chambers 74 and 76 for backseats of the air bag bag body 16, the completion time amount of expansion of the air bag bag body 16 can be shortened.

[0042] In addition, as shown in drawing 7 , the non-expanding section 24 formed in the expansion chambers 26, 28, 30, and 32 for front seats swelled to the upstream (front side) near an inflator 14 like the 1st operation gestalt, and is good also as circular.

[0043] Next, the 3rd operation gestalt of the head protection air bag equipment of this invention is explained according to drawing 8 and drawing 9 .

[0044] In addition, if attached to the same member as the 2nd operation gestalt, the same sign is attached and the explanation is omitted.

[0045] As shown in drawing 9 , with this operation gestalt, the inflator 14 is arranged by the lower part of the quarter pillar 44, and strap 16G formed in the front end lower part of the air bag bag body 16 are being fixed to the lower part of a front pillar 20.

[0046] As shown in drawing 8 , the gas installation path 40 is formed in the upper part of back end

section 16C of the air bag bag body 16 with this operation gestalt. The liner tube 42 for reinforcement in the gas installation path 40 It has reached exceeding the expansion chambers 76 and 74 for backseats to the expansion chamber 32 for front seats of the upstream (with this operation gestalt, since an inflator 14 is in car back, it becomes a back side) near an inflator 14 from the inflator 14 (refer to drawing 9) connected with the back end of the gas installation path 40.

[0047] Therefore, the gas spouted from the inflator 14 is previously supplied with the liner tube 42 for reinforcement from the expansion chamber 32 for front seats of the upstream near an inflator 14.

[0048] Moreover, the cross-sectional area S1 of the gas installation path 80 which opens the expansion chamber 74 for backseats and the expansion chamber 32 for front seats for free passage is larger than the cross-sectional area S2 of the liner tube 42 for reinforcement, and gas flows between the gas installation path 80 and the liner tubes 42 for reinforcement.

[0049] Next, an operation of this operation gestalt is explained. The gas spouted from the inflator 14 arranged by the lower part of the quarter pillar 44 with the head protection air bag equipment of this operation gestalt While the expansion chamber 32 for front seats of the upstream (back side) near an inflator 14 is supplied and other expansion chambers 30, 28, and 26 for front seats are supplied after that with the liner tube 42 for reinforcement The expansion chambers 74 and 76 for backseats are also supplied from the gas installation path 80 which opens the expansion chamber 74 for backseats, and the expansion chamber 32 for front seats for free passage, and the clearance between the liner tubes 42 for reinforcement. Consequently, the completion time amount of expansion of the air bag bag body 16 can be shortened.

[0050] Moreover, since the completion time amount of expansion of the air bag bag body 16 can be easily shortened with the head protection air bag equipment of this operation gestalt only by installing the liner tube 42 for reinforcement to add to the front, without changing the configuration of the air bag bag body 16 substantially, there is no large cost high.

[0051] Next, the 4th operation gestalt of the head protection air bag equipment of this invention is explained according to drawing 10.

[0052] In addition, if attached to the same member as the 3rd operation gestalt, the same sign is attached and the explanation is omitted.

[0053] As shown in drawing 10, although the difference of the cross-sectional area S1 of the gas installation path 80 which opens the expansion chamber 74 for backseats and the expansion chamber 32 for front seats for free passage, and the cross-sectional area S2 of the liner tube 42 for reinforcement is small, with this operation gestalt, two or more holes 82 as gas supply opening for supplying gas to the expansion chambers 74 and 76 for backseats are formed in the expansion chambers 74 and 76 for backseats of the liner tube 42 for reinforcement, and the part which counters. These holes 82 are formed over the periphery whole region of the liner tube 42 for reinforcement, and do not call at the fitting location to the air bag bag body 16 of the liner tube 42 for reinforcement, but gas is sent in into the expansion chamber 76 for backseats certainly and promptly because which hole 82 is suitable in the **** direction of the expansion chambers 74 and 76 for backseats.

[0054] Therefore, the gas spouted from the inflator 14 is supplied to the expansion chamber 32 for front seats near an inflator 14, and after that, it is supplied to the expansion chambers 74 and 76 for backseats through a hole 82 with it while other expansion chambers 30, 28, and 26 for front seats are supplied by the liner tube 42 for reinforcement.

[0055] Next, an operation of this operation gestalt is explained. With the head protection air bag equipment of this operation gestalt, the gas spouted from the inflator 14 arranged by the lower part of the quarter pillar 44 is supplied to the expansion chambers 74 and 76 for backseats through a hole 82 while it is supplied to the expansion chamber 32 for front seats of the upstream (back side) near an inflator 14 and is supplied to other expansion chambers 30, 28, and 26 for front seats after that with the liner tube 42 for reinforcement. Consequently, the completion time amount of expansion of the air bag bag body 16 can be shortened.

[0056] Moreover, without changing the configuration of the air bag bag body 16 substantially with the head protection air bag equipment of this operation gestalt, the liner tube 42 for reinforcement to add is

installed to the front, and since the completion time amount of expansion of the air bag bag body 16 can be easily shortened only by forming a hole 82, there is no large cost high.

[0057] In addition, with this operation gestalt, although the hole 82 was formed in the liner tube 42 for reinforcement as gas supply opening, it may replace with a hole 82 and other gas supply openings, such as a slit, notching, and a tee, may be formed in the liner tube 42 for reinforcement.

[0058] Next, the 5th operation gestalt of the head protection air bag equipment of this invention is explained according to drawing 11.

[0059] In addition, the same sign is attached about the same member as the 2nd operation gestalt, and the explanation is omitted.

[0060] As shown in drawing 11, the gas installation path 40 of the air bag bag body 16 connected to the single inflator 14 arranged by the lower part of a front pillar 20 with this operation gestalt It is divided into the 1st gas installation path 84 for supplying gas to the expansion chambers 26, 28, 30, and 32 for front seats, and the 2nd gas installation path 86 for supplying gas to the expansion chambers 74 and 76 for backseats, and these 1st gas installation paths 84 and the 2nd gas installation path 86 are independently mutually.

[0061] Next, an operation of this operation gestalt is explained. With the head protection air bag equipment of this operation gestalt, if side ***** beyond a predetermined value acts on a car-body flank, having had a side collision will be detected by the sensor 12. For this reason, an inflator 14 operates and the gas of the specified quantity is spouted.

[0062] Under the present circumstances, with the head protection air bag equipment of this operation gestalt, the expansion chambers 74 and 76 for backseats are also supplied through the 2nd gas installation path 86 at the same time the gas spouted from the inflator 14 is supplied to the expansion chambers 26, 28, 30, and 32 for front seats through the independent 1st gas installation path 84. Consequently, gas can be quickly supplied also to the expansion chambers 74 and 76 for backseats far from an inflator 14, and the completion time amount of expansion of an air bag bag body can be shortened.

[0063] Moreover, since the completion time amount of expansion of the air bag bag body 16 can be easily shortened with the head protection air bag equipment of this operation gestalt only by dividing the gas installation path 40 into the 1st gas installation path 84 and the 2nd gas installation path 86, without changing the configuration of the air bag bag body 16 substantially, there is no large cost high.

[0064] Moreover, with this operation gestalt, each expansion timing of the expansion chambers 26, 28, 30, and 32 for front seats and the expansion chambers 74 and 76 for backseats can be easily adjusted by adjusting the cross section of the independent 1st gas installation path 84, and the cross section of the 2nd gas installation path 86. Furthermore, in order to arrange the independent gas installation path along with a front pillar 20, the crew head protection area in a front pillar 20 is expanded.

[0065] Next, the 6th operation gestalt of the head protection air bag equipment of this invention is explained according to drawing 12.

[0066] In addition, the same sign is attached about the same member as the 5th operation gestalt, and the explanation is omitted.

[0067] As shown in drawing 12, the gas installation path 40 of the air bag bag body 16 connected to the single inflator 14 arranged by the lower part of the quarter pillar 44 with this operation gestalt It is divided into the 1st gas installation path 88 for supplying gas to the expansion chambers 26, 28, 30, and 32 for front seats, and the 2nd gas installation path 90 for supplying gas to the expansion chambers 74 and 76 for backseats, and these 1st gas installation paths 88 and the 2nd gas installation path 90 are independently mutually.

[0068] Next, an operation of this operation gestalt is explained. With the head protection air bag equipment of this operation gestalt, the expansion chambers 74 and 76 for backseats are also supplied through the 2nd gas installation path 90 at the same time the gas spouted from the inflator 14 is supplied to the expansion chambers 26, 28, 30, and 32 for front seats through the independent 1st gas installation path 88. Consequently, gas can be quickly supplied also to the expansion chambers 26, 28, 30, and 32 for front seats far from an inflator 14, and the completion time amount of expansion of an air bag bag

body can be shortened.

[0069] Moreover, since the completion time amount of expansion of the air bag bag body 16 can be easily shortened with the head protection air bag equipment of this operation gestalt only by dividing the gas installation path 40 into the 1st gas installation path 88 and the 2nd gas installation path 90, without changing the configuration of the air bag bag body 16 substantially, there is no large cost high.

[0070] Moreover, with this operation gestalt, each expansion timing of the expansion chambers 26, 28, 30, and 32 for front seats and the expansion chambers 74 and 76 for backseats can be easily adjusted by adjusting the cross section of the independent 1st gas installation path 88, and the cross section of the 2nd gas installation path 90.

[0071] Next, the 7th operation gestalt of the head protection air bag equipment of this invention is explained according to drawing 13 and drawing 14.

[0072] In addition, the same sign is attached about the same member as the 5th operation gestalt, and the explanation is omitted.

[0073] As shown in drawing 14, the branch pipe 92 is arranged in the connection section of the single inflator 14 and the air bag bag body 16 which are arranged by the lower part of a front pillar 20 with this operation gestalt.

[0074] As shown in drawing 13, this branch pipe 92 is constituted from the base fabric of the air bag bag body 16 by metals, such as iron, rigid high construction material, for example, aluminum, resin, etc., and one edge 92A of a branch pipe 92 is connected with the inflator 14. Moreover, the 2nd gas installation path 86 of the air bag bag body 16 is connected with other-end section 92C by which the 1st gas installation path 84 of the air bag bag body 16 is connected with edge 92B, and while branching to the two forks of a branch pipe 92 branched to two forks. By the metal ring 94, these 1st gas installation paths 84 and the 2nd gas installation path 86 are caulking ***** to the edges 92B and 92C of a branch pipe 92, respectively.

[0075] Next, an operation of this operation gestalt is explained. It is divided into the 1st gas installation path 84 which the gas spouted from the inflator 14 opens for free passage to the expansion chambers 26, 28, 30, and 32 for front seats through the rigid high branch pipe 92, and the 2nd gas installation path 86 which is open for free passage to the expansion chambers 74 and 76 for backseats with the head protection air bag equipment of this operation gestalt. That is, since the tee of gas was set as the rigid high branch pipe 92 formed in the exterior of the air bag bag body 16 with this operation gestalt, breakage of the base fabric of the air bag bag body 16 by the high pressure gas spouted from an inflator 14 can be prevented.

[0076] In addition, although the inflator 14 was arranged in the lower part of a front pillar 20 with this operation gestalt, as it replaces with this and is shown in drawing 15, it is good also as a configuration which arranged the inflator 14 in the lower part of the quarter pillar 44, and was set as the branch pipe 92 between this inflator 14, and the 1st gas installation path 88 of the air bag bag body 16 and the 2nd gas installation path 90.

[0077] Although this invention was explained above about the specific operation gestalt at the detail, this invention is not limited to this operation gestalt, and it is clear for this contractor its for other various operation gestalten to be possible within the limits of this invention. For example, when it constitutes the expansion section and the non-expanding section of the air bag bag body 16, even if constituted by suturing and pasting up the predetermined part of a base fabric, you may constitute by changing the weave of a base fabric.

[0078]

[Effect of the Invention] The single inflator in which this invention according to claim 1 is arranged by the pillar lower part, The curtain-like air bag bag body with which two or more expansion chambers were formed in the direction which intersects the tension line with which it is stored in ranging over a roof side from a pillar, and the body flank order fixed point is contracted of the non-expanding section, In preparation ***** protection air bag equipment, in the gas installation path to each expansion chamber in an air bag bag body Since it has a liner tube for reinforcement for being installed to the location which exceeds the upstream expansion chamber near an inflator from the connection section

with an inflator, and supplying gas previously from a downstream expansion chamber far from an inflator, It is not accompanied by the large cost high, but has the outstanding effectiveness that the completion time amount of expansion of an air bag bag body can be shortened.

[0079] In head protection air bag equipment according to claim 1, an inflator is arranged for this invention according to claim 2 by A pillar lower part, and since an air bag bag body is an object for front seats, it adds to effectiveness according to claim 1, and it has the outstanding effectiveness that the load by the high pressure gas to A pillar garnish at the time of air bag bag body expansion expansion can be reduced.

[0080] This invention according to claim 3 is set to head protection air bag equipment according to claim 1. Since the inflator was arranged by A pillar lower part, the air bag bag body was equipped with two or more expansion chambers for front seats and expansion chambers for backseats and the liner tube for reinforcement is prolonged to the location which can supply gas to the downstream expansion chamber in the expansion chamber for front seats, It has the outstanding effectiveness that in addition to effectiveness according to claim 1 gas can be quickly supplied also to the expansion chamber for backseats, and the completion time amount of expansion of an air bag bag body can be shortened.

[0081] This invention according to claim 4 is set to head protection air bag equipment according to claim 1. It is arranged by C pillar lower part and, as for an inflator, an air bag bag body is equipped with two or more expansion chambers for front seats and expansion chambers for backseats. The liner tube for reinforcement is prolonged to the location which can supply gas to the upstream expansion chamber of the expansion chamber for front seats exceeding the expansion chamber for backseats. And since the cross-sectional area of the gas installation path between the expansion chamber for front seats and the expansion chamber for backseats is larger than the cross-sectional area of the liner tube for reinforcement, Also when an inflator is arranged in C pillar lower part, it is not accompanied by the large cost high, but has the outstanding effectiveness that the completion time amount of expansion of an air bag bag body can be shortened.

[0082] This invention according to claim 5 is set to head protection air bag equipment according to claim 1. It is arranged by C pillar lower part and, as for an inflator, an air bag bag body is equipped with two or more expansion chambers for front seats and expansion chambers for backseats. The liner tube for reinforcement is prolonged to the location which can supply gas to the upstream expansion chamber of the expansion chamber for front seats exceeding the expansion chamber for backseats. And since gas supply opening for supplying gas to the expansion chamber for backseats is formed in the liner tube for reinforcement, Also when an inflator is arranged in C pillar lower part, it is not accompanied by the large cost high, but has the outstanding effectiveness that the completion time amount of expansion of an air bag bag body can be shortened.

[0083] The single inflator in which this invention according to claim 6 is arranged by the pillar lower part, The curtain-like air bag bag body with which two or more expansion chambers were formed in the direction which intersects the tension line with which it is stored in ranging over a roof side from a pillar, and the body flank order fixed point is contracted of the non-expanding section, Since the gas installation path to the expansion chamber for front seats in an air bag bag body and the gas installation path to the expansion chamber for backseats are independently mutually in preparation ***** protection air bag equipment, It is not accompanied by the large cost high, but has the outstanding effectiveness that the completion time amount of expansion of an air bag bag body can be shortened. Moreover, each expansion timing adjustment of the expansion chamber for front seats and the expansion chamber for backseats is easy, and when an inflator is arranged in A pillar lower part, it has the outstanding effectiveness that the crew head protection area of A pillar section is expanded.

[0084] In head protection air bag equipment according to claim 6, since this invention according to claim 7 connected to the inflator the gas installation path of the expansion chamber for front seats and the gas installation path of the expansion chamber for backseats which were formed in the air bag bag body through the rigid high branch pipe from the base fabric of an air bag bag body, it has the outstanding effectiveness that breakage of the base fabric of the air bag bag body by the high pressure gas spouted from an inflator can be prevented in addition to effectiveness according to claim 6.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] In the head protection air bag equipment concerning the 1st operation gestalt of this invention, it is the outline side elevation seen from the vehicle interior-of-a-room side which shows the condition that the air bag bag body carried out expansion expansion.

[Drawing 2] In the head protection air bag equipment concerning the 1st operation gestalt of this invention, it is the outline side elevation seen from the vehicle interior-of-a-room side which shows the storing condition of an air bag bag body.

[Drawing 3] It is the expanded sectional view which met three to 3 line of drawing 2 .

[Drawing 4] It is the expanded sectional view which met four to 4 line of drawing 2 .

[Drawing 5] It is the side elevation showing the air bag bag body of the head protection air bag equipment concerning the 2nd operation gestalt of this invention.

[Drawing 6] In the head protection air bag equipment concerning the 2nd operation gestalt of this invention, it is the outline side elevation seen from the vehicle interior-of-a-room side which shows the condition that the air bag bag body carried out expansion expansion.

[Drawing 7] It is the side elevation showing the air bag bag body of the head protection air bag equipment concerning the modification of the 2nd operation gestalt of this invention.

[Drawing 8] It is the side elevation showing the air bag bag body of the head protection air bag equipment concerning the 3rd operation gestalt of this invention.

[Drawing 9] In the head protection air bag equipment concerning the 3rd operation gestalt of this invention, it is the outline side elevation seen from the vehicle interior-of-a-room side which shows the condition that the air bag bag body carried out expansion expansion.

[Drawing 10] It is the side elevation showing the air bag bag body of the head protection air bag equipment concerning the 4th operation gestalt of this invention.

[Drawing 11] In the head protection air bag equipment concerning the 5th operation gestalt of this invention, it is the outline side elevation seen from the vehicle interior-of-a-room side which shows the condition that the air bag bag body carried out expansion expansion.

[Drawing 12] In the head protection air bag equipment concerning the 6th operation gestalt of this invention, it is the outline side elevation seen from the vehicle interior-of-a-room side which shows the condition that the air bag bag body carried out expansion expansion.

[Drawing 13] It is the amplification perspective view showing the connection section by the branch pipe of the head protection air bag equipment concerning the 7th operation gestalt of this invention.

[Drawing 14] In the head protection air bag equipment concerning the 7th operation gestalt of this invention, it is the outline side elevation seen from the vehicle interior-of-a-room side which shows the condition that the air bag bag body carried out expansion expansion.

[Drawing 15] In the head protection air bag equipment concerning the modification of the 7th operation gestalt of this invention, it is the outline side elevation seen from the vehicle interior-of-a-room side which shows the condition that the air bag bag body carried out expansion expansion.

[Drawing 16] It is the outline side elevation showing the storing condition of the air bag bag body in the

head protection air bag equipment concerning the conventional operation gestalt.

[Description of Notations]

10 Head Protection Air Bag Equipment

12 Sensor

14 Inflator

16 Air Bag Bag Body

18 Center Pillar (B Pillar)

20 Front Pillar (A Pillar)

22 Instrument Panel

24 Non-Expanding Section

26 Expansion Section for Front Seats

28 Expansion Section for Front Seats

30 Expansion Section for Front Seats

32 Expansion Section for Front Seats

34 Non-Expanding Section

38 Roof Side Rail

40 Gas Installation Path

42 Liner Tube for Reinforcement

44 Quarter Pillar (C Pillar)

46 Front Pillar Garnish

48 Roof Headlining

74 Expansion Chamber for Backseats

76 Expansion Chamber for Backseats

78 Non-Expanding Section

80 Gas Installation Path

82 Hole (Gas Supply Opening)

84 1st Gas Installation Path

86 2nd Gas Installation Path

88 1st Gas Installation Path

90 2nd Gas Installation Path

92 Branch Pipe

[Translation done.]

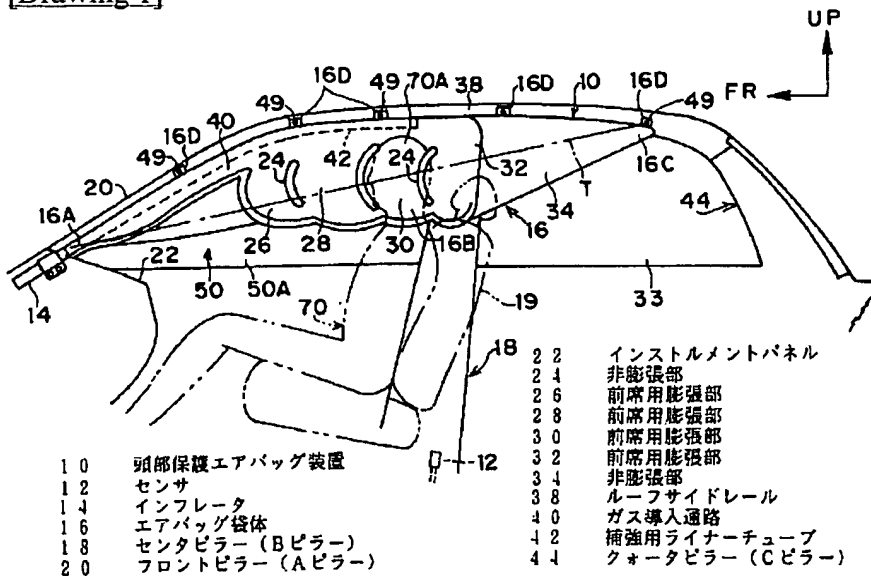
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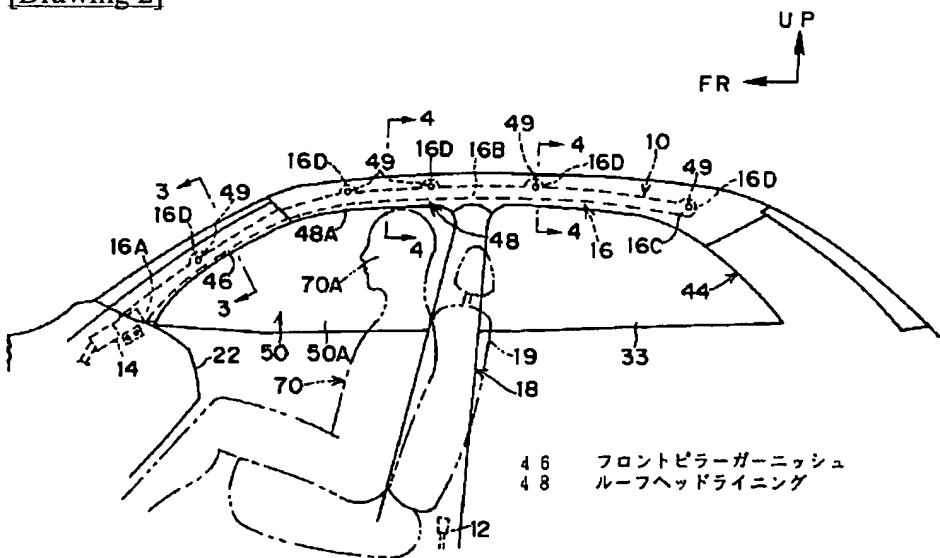
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DRAWINGS

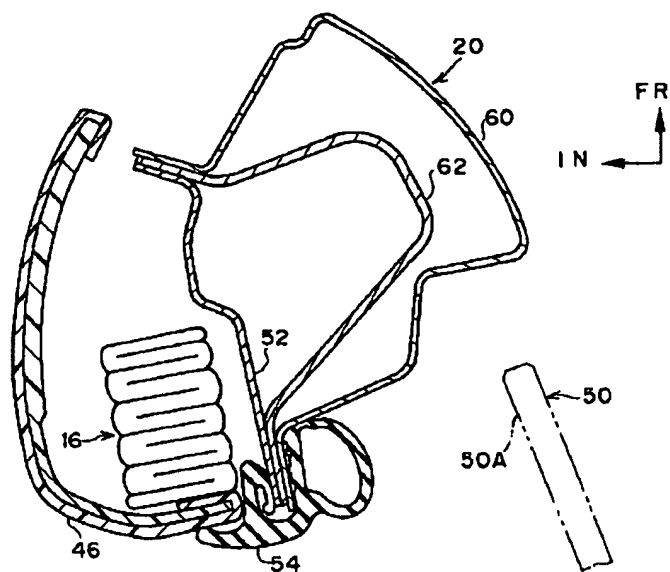
[Drawing 1]



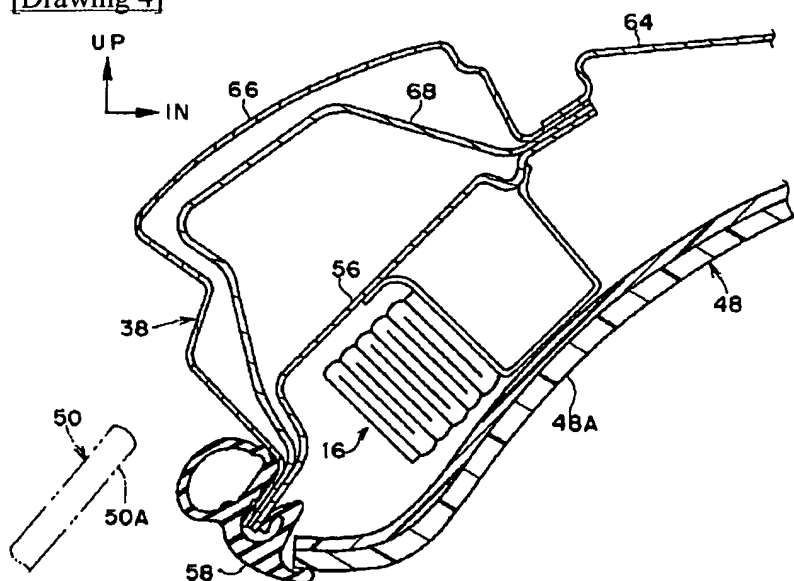
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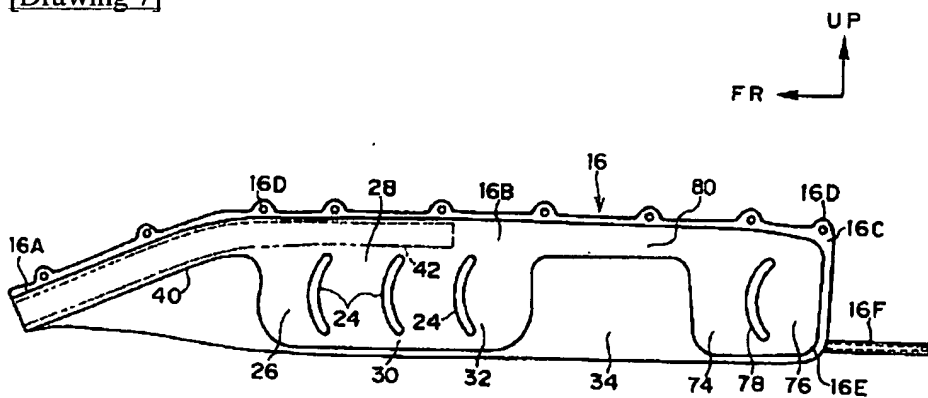
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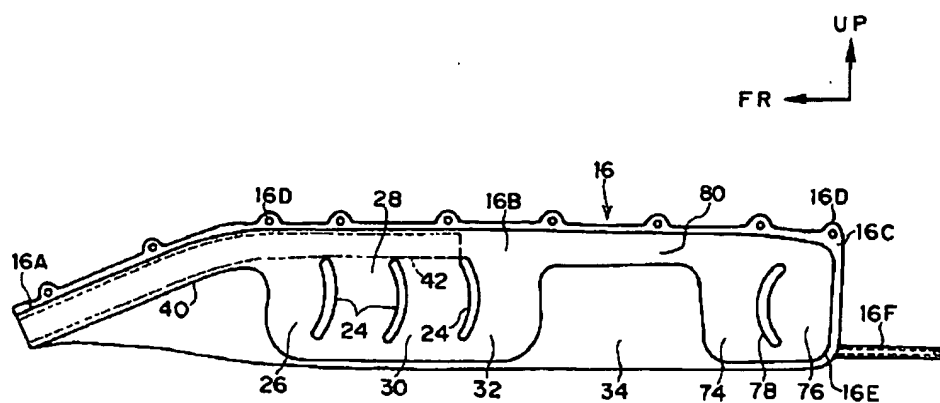
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[Drawing 7]

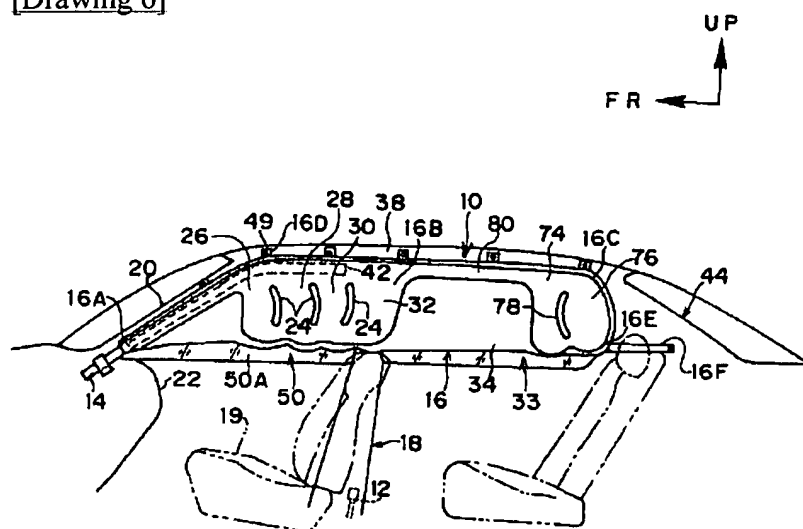


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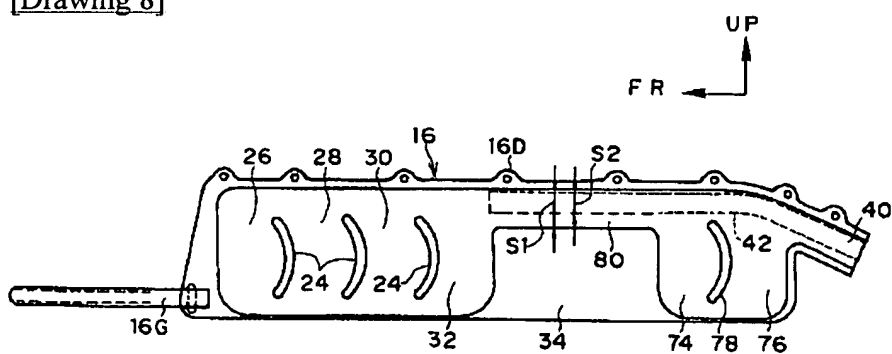


7 4 後席用膨張室
7 6 後席用膨張室
7 8 非膨張部

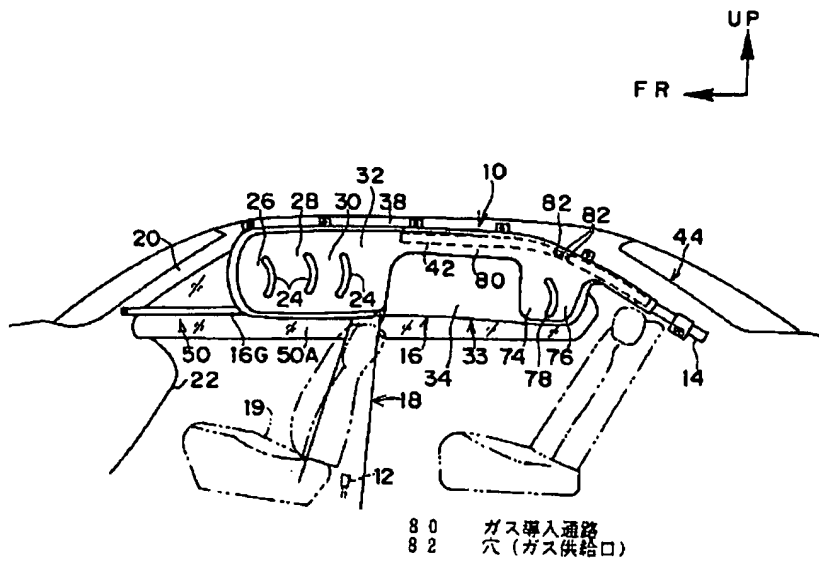
[Drawing 6]



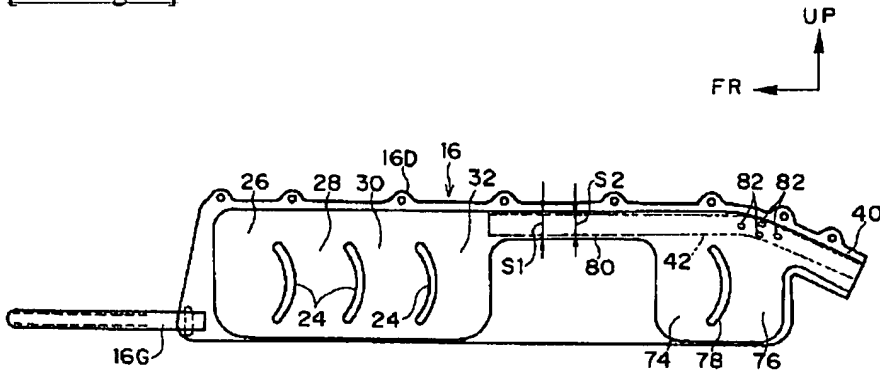
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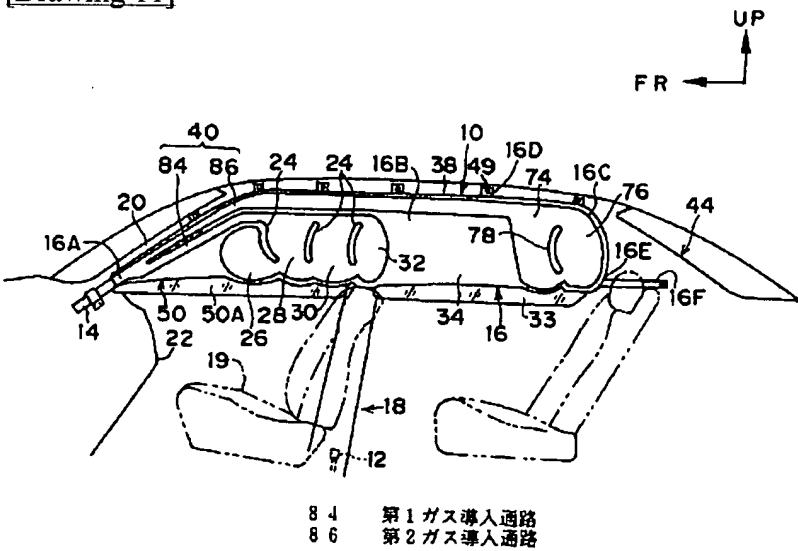
[Drawing 9]



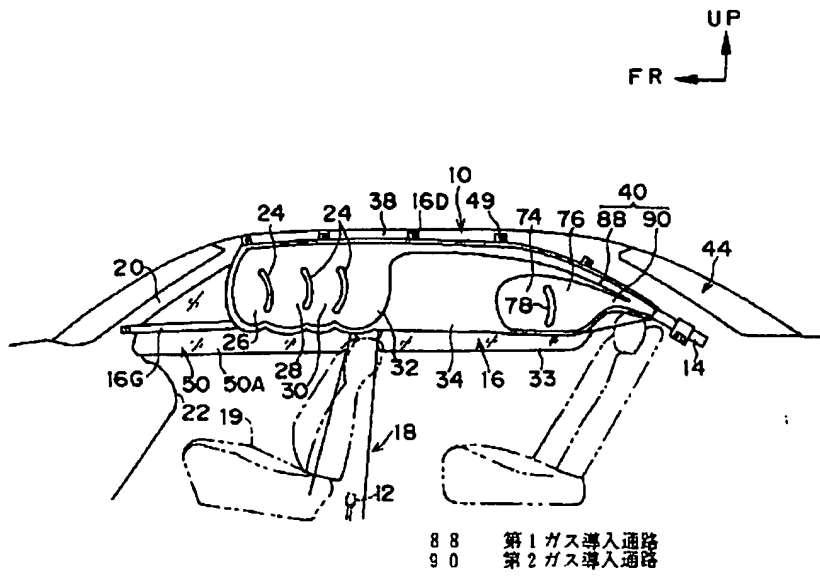
[Drawing 10]



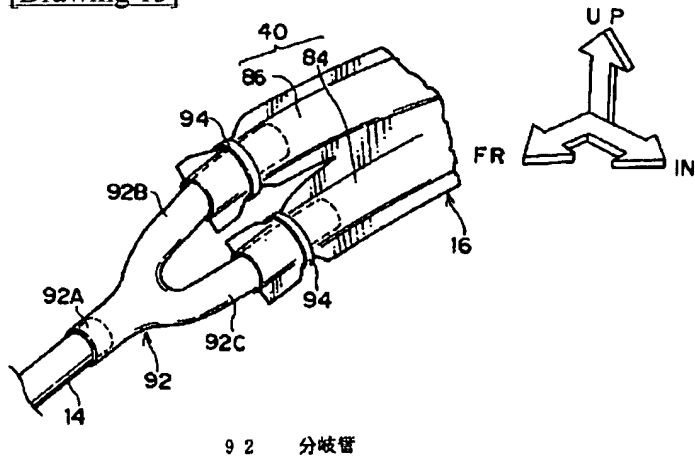
[Drawing 11]



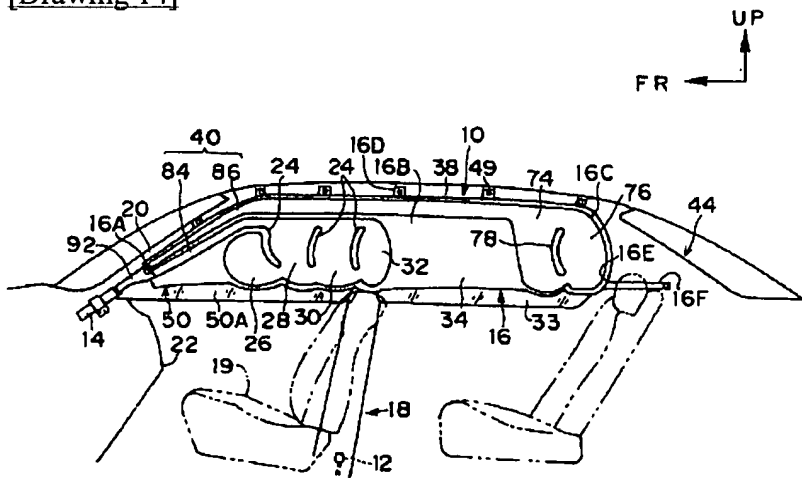
[Drawing 12]



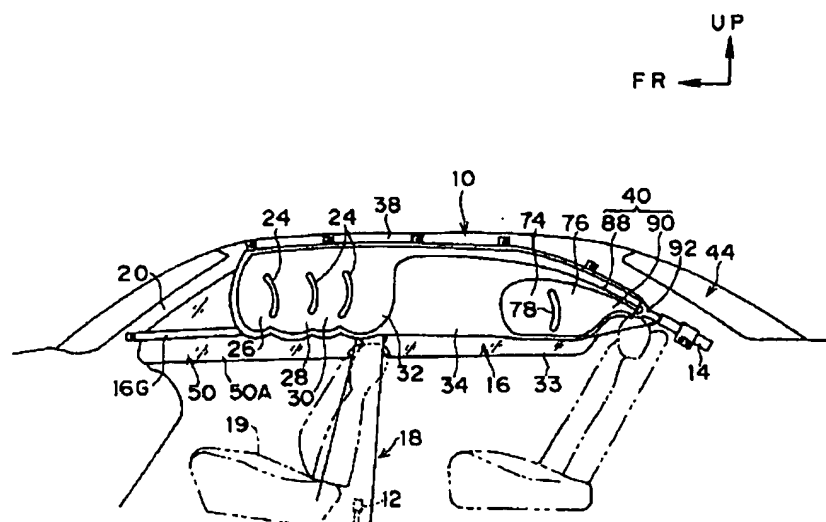
[Drawing 13]



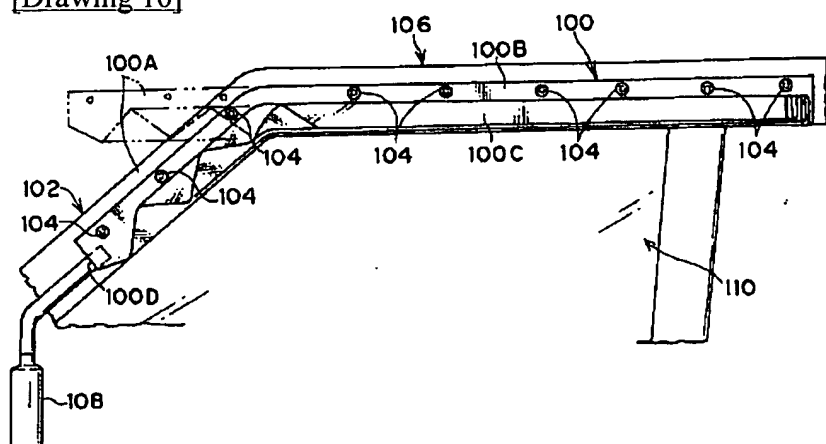
[Drawing 14]



[Drawing 15]



[Drawing 16]



[Translation done.]